

2011

ACHPER TRIAL EXAMINATION

VCE PHYSICAL EDUCATION

NOTES FOR TEACHERS

Please note the following:

1. The November examination will consist of two sections. **Section A** will consist of multiple-choice questions. Students will be required to mark their responses on a multiple-choice answer sheet. A mock blank version is also provided if teachers wish to use this for the ACHPER Trial Examination.
Section B will consist of short-answer and extended -response questions.
2. To duplicate the format of the November examination, it is suggested that you present the ACHPER Trial Examination as a question booklet to give students practice at completing an examination in this format.
3. Students will be required to write their student number in figures and in words. They should practice this on the ACHPER Trial Examination, as indicated.
4. The ACHPER Trial Examination has been designed to provide students with the opportunity to use the full two hours of writing time.
5. The ACHPER Trial Examination should not vary considerably in format to the November examination; however, the type of stimulus material used, the number of questions and the allocated marks may be different. (Note: The ACHPER Trial Examination may have fewer graphics and photographs, due to copyright restrictions.)
6. The suggested answers provided in this booklet should be used as a guide only and do not represent all possible answers that students could write.
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Suggested Answers

SOLUTION PATHWAY

This solution pathway is not intended to be a definitive set of answers in all cases. Students may provide factually correct responses that have not been outlined here.

These answers are a set of sample responses and a guide to the acceptable depth and range of possible responses.

Section A: Multiple-choice Questions

Question	Answer
1	D
2	B
3	D
4	B
5	C
6	A
7	B
8	C
9	A
10	C
11	D
12	B
13	C
14	A
15	B

1 mark each = **15 marks**

Section B: Short answer questions

- Question 1 a**
- i.** Red blood cells (take haemoglobin) 1 mark
- ii.** Legal
- High altitude training
 - Continuous / fartlek (In 2010 VCAA accepted Fartlek as a specific training method) aerobic/long interval training
 - Hypoxic tent (a normobaric hypoxic living environment)
 - Intermittent hypoxic training
- Illegal
- Erythropoietin (EPO)
 - Blood Doping
 - Genetic manipulation (gene doping)
- 2 marks
- iii.** *Note -Death or any cardiac side effects not accepted as per question*
- EPO: Blood clots, stroke, blood borne disease (such as AIDS, hepatitis due to poor needle hygiene practices)
 - Blood Doping: Blood borne disease (such as AIDS, hepatitis due to poor needle hygiene practices), blood clots, stroke
 - Genetic manipulation: Gene therapy is a developing technology & so negative side effects are still unknown
- 1 mark

Question 1 b*Any two of the following:*

- Medical/scientific/pharmacological evidence or experience showing that the method can or does enhance performance.
- The determination by WADA that the method violates the spirit of sport described in its code including medical/scientific/pharmacological evidence or experience showing that the method has the potential to mask the use of other prohibited methods or substances.
- Medical/scientific/pharmacological evidence or experience showing that the method can or does present and actual or potential health risk.

2 marks

Question 1 c*Any two of the following:*

- Detection of doping violations (including control and violations).
- Deterrence of doping violations – educating athletes about the risks and consequences of using illegal methods to enhance performance.
- Enforcement of doping controls – managing cases where violations have occurred.
- Eliminate doping.
- Implementation of the World Anti-Doping Code in Australia.

2 marks

Total 8 marks**Question 2 a****i.** Diary or Log

1 mark

ii. Advantages:

- Can capture quantitative and qualitative information
- Can be administered quickly and easily
- Cost effective for large scale studies
- Have the ability to predict energy expenditure

Disadvantages:

- Not suitable for assessing children under 10 or older adults
- Problems associated with social desirability bias, memory limitation

2 marks

Question 2 b *Correct week (1 mark) plus explanation (2 marks)*

Week 7. The total of 3 hours suggests 30 minutes of moderate- intensity physical activity on most days as suggested by the NPAG for this age group.

3 marks

Question 2 c *Any of the following:*

- Individual Environment: ‘The swap it don’t stop it’ campaign encourages goal setting and is an example of mass media targeting individuals such as this male to consider being more active with tools provided to support the individual.
- Social environment: The swap it don’t stop it campaign aims to alter social norms and influences in relation to people’s attitudes to physical activity. This is aiming to increase the physical activity levels of the general population.

2 marks

Total 8 marks

Question 3 a Aerobic Capacity

1 mark

Question 3 b

- i. No 1 mark
- ii. Throughout the test the subject's heart rate is continually increasing, showing no signs of a plateau (1 mark) which would indicate a period of steady state. (1 mark) 2 marks

Question 3 c

VO₂ maximum test on either a treadmill/bike/rowing ergometer

1 mark

Question 3 d

Improve.

1 mark

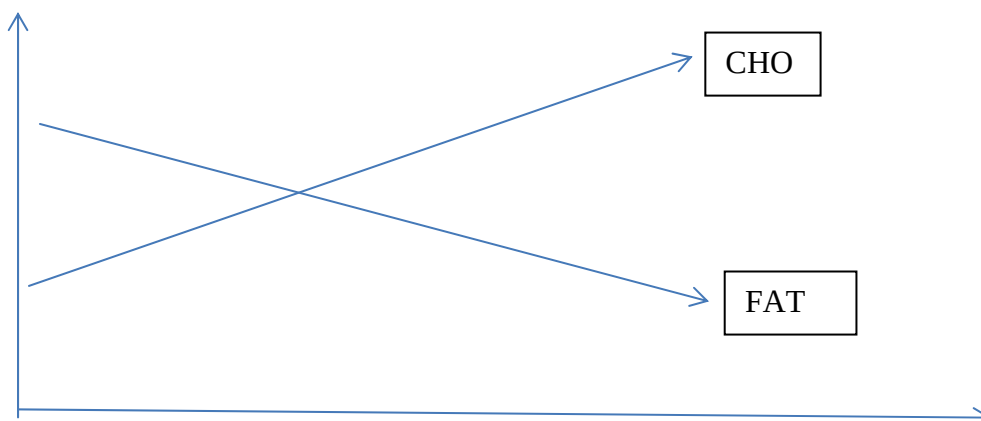
VO₂ maximum is measured in ml/kg/min. They have the same amount of muscle so will therefore consume the same amount of oxygen. Their weight has gone down (less body fat) so will have less weight to divide into oxygen consumption so therefore the final calculation will increase.

2 marks

Question 3 e

- i. Ideally an active recovery involves performing the same activity at a reduced intensity (40-60%) 1 mark
- ii. The purpose of an active recovery is to extend EPOC (or to maintain elevated oxygen levels to the muscle to remove metabolic by-products at a faster rate) (1 mark) and to prevent venous pooling. (1 mark) 2 marks

Question 3 f Answer below.



- i. The graph should display that as intensity increases (as each level on the 20m MSFT represents an increase in intensity) so does CHO usage; conversely fat usage will decrease. 2 marks

- ii. As intensity increases throughout the various levels so does the required rate of ATP resynthesis. CHO can resynthesise ATP at a faster rate than fat and therefore its contribution will increase, while fats contribution will decrease.

2 marks

Question 3 g

- i. Any two of the following (students can not receive full marks if the two responses chosen work against each other eg: increased ventilation and increased respiratory rate)

- Increased ventilation
- Increased tidal volume
- Increased respiratory rate
- Increased pulmonary diffusion
- Increased oxygen uptake

2 marks

- ii. Any two of the following

- Continuous training
- Fartlek training
- Long interval training
- Circuit training

2 marks

- iii. In the above table students should demonstrate:

- Frequency – 3 sessions on alternative days (1 mark)
- Intensity – 70 – 85% of max. HR (1 mark)
- Duration – Each session should go for at least 20 minutes (1 mark)
- Rest day(s) have been demonstrated (1 mark)

4 marks

Total 23 marks

Question 4 a

Appropriate venues for recreational activities such as parks and open spaces allow for people to participate in physical activity it also is an attractive environment that will hopefully encourage people to come back to the venue and be involved in recreational activities such as walking/cycling.

2 marks

Question 4 b Any one of the following

- Ensure there is adequate play equipment at open spaces to encourage young people to play in the parks and open spaces
- Provide funding to develop safe well lit walking cycling tracks through the open spaces and parks

Advertise parks and open spaces with their various equipment/ facilities on the 'Go for your life website' and other affiliate government agencies such as Parks Victoria

1 mark

Question 4 c

- Direct Observation although expensive would give information about behaviours in parks and open spaces.
- Recall Survey of people living within a specific area of an open space or park.

1 mark

Question 4 d

The National Heart Foundation collaborates with many government and non-government bodies to promote heart health. Healthy Spaces and Places is encouraging development of built environments that provide an opportunity to be active and to improve health outcomes for all Australians. The National Heart Foundation would be involved in Healthy Spaces and Places as preventative program to support heart health require appropriate open space and parks for people to exercise and be involved in recreation pursuits in all areas of Australia.

(1 mark for knowledge of NHF, 1 mark for link between the NHF and the initiative).

2 marks

Total 6 marks

Question 5

Throughout the race all 3 E/S are always in use to provide ATP for the working muscles. However, one will be more predominant than the others depending on intensity, duration and type of activity.

1 mark

At the start of race the ATP-CP E/S will predominate because the push-off the wall and the start is maximal intensity.

1 mark

The ATP-CP E/S will continue to predominantly provide ATP because the athlete is working at high intensity, until CP stores deplete after 6-10 seconds. Anaerobic Glycolysis then predominates until around the 60 second mark.

1 mark

From the start of the race the athlete's cardio-respiratory systems have been increasing the body's ability to take up, transport & use oxygen but the body has been in oxygen deficit (using the anaerobic E/S to provide ATP, as stated above).

1 mark

After approximately 60 seconds, the aerobic E/S is predominant because the race lasts for 4 minutes 39 seconds and is a continuous event with no rest, so ATP-CP stores cannot be replenished.

1 mark

At times of higher intensity during the race, such as; tumble turns at the end of each lap, increasing speed, sprinting at the end of the race, etc. anaerobic glycolysis provides the 'top up' of ATP.

1 mark

Total 6 marks

Question 6 a

Aerobic Glycolysis or Aerobic E/S.

1 mark

Question 6 b

- i. Aerobic training results in the body producing more (& larger) mitochondria, thus increasing the body's ability to 'glycogen spare' (1 mark) where the body uses a greater contribution of fats to produce ATP at submaximal intensities and 'spares' CHO. (1mark)

2 marks

- ii. By utilising more fats, this helps prevent glycogen depletion ('hitting the wall') during the event (1mark) which means the body must metabolise fats for ATP which uses more oxygen, so performances decreases or ensuring there is enough glycogen to allow for increased intensities at the end of the race, such as the final sprint (1mark).

2 marks

Question 6 c

Dietary: Eat/drink a high CHO diet for 3-4 days of approximately 7-10g per kg of body weight approximately 1-4 days prior to the event.

Training: Taper (reduce) training load (volume of training).

2 marks

Question 6 d

- i. Advantage:
Reduced chance of dehydration during event or reduced chance of elevated body temperature during event
Description: About 2.7g of water is stored for each gram of glycogen stored, so the body stores more water than usual, resulting in less chance of dehydration & also assists in thermoregulation, when water is released when glycogen is broken down to produce ATP.

3 marks

- ii. Two disadvantages
- Weight gain through retention of water to store glycogen molecules
 - By increasing the amount of CHO eaten the athlete's diet may become 'unbalanced', where less protein, for example, is consumed.

2 marks

Question 6 e

Protein

1 mark

Question 6 f

- i. Any 2 of the following
- Increased mitochondrial size/density
 - Increased myoglobin
 - Increased muscle
 - Glycogen stores
 - Increased oxidative/glycolytic
 - Enzyme capacity
- ii. Any 2 of the following
- Increased mitochondrial size/density – more/larger sites for aerobic production of ATP (1 mark) thus increasing the ability to aerobically produce more ATP, leading to improved performance (1 mark)
 - Increased myoglobin – Greater ability to transport oxygen to mitochondria (1 mark) and increased aerobic ATP production leading to increased performance (1 mark)
 - Increased glycogen stores – Greater amount of fuel for aerobic E/S (1 mark) thus less chance of glycogen depletion during the event leading to increased performance (1 mark)
 - Increased oxidative/glycolytic enzyme capacity – greater/faster ability to aerobically produce ATP (1 mark) thus leading to improved performance through a greater ATP capacity (1 mark)

2 marks

Question 6 g

- i. Samuel has a higher LIP (Lactate Inflection Point) 1 mark
- ii. A higher LIP means that Samuel can clear lactate (& thus H⁺ ions) at a faster rate (1 mark) and can therefore, work at a higher intensity for a longer period of time without accumulation of H⁺ ions (1 mark)

2 marks

Question 6 h

Dehydration leads to lower blood plasma volume (1 mark) which leads to hypertension & less blood (& oxygen) being transported to the working muscles. (1 mark)

Dehydration leads to elevated core temperature which leads to vasodilation of the peripheral blood vessels to assist thermoregulation (1 mark) & so less blood flow (& oxygen) to the working muscles leading to decreased performance. (1 mark)

2 marks

Total 22 marks**Question 7 a**

Respiratory Rate	INCREASE
Diastolic Blood Pressure	REMAINS THE SAME
Stored ATP	DECREASE
Motor Unit Recruitment	INCREASE
a-vO ₂ difference	INCREASE

5 marks

Question 7 b

Blood is directed away from our organs and inactive muscles via vasoconstriction of the blood vessels surrounding these areas, conversely the blood vessels surrounding the working muscles vasodilate to facilitate an increased blood flow to these muscles. The purpose is to increase blood supply to the working muscles.

2 marks

Question 7 c

- i. B 1 mark
- ii. Hypotonic drinks are absorbed faster than the other options (1 mark) and will therefore counteract the likely impact of dehydration more quickly. (1 mark)

2 marks

Question 7 d

The uncton of stretching is to return muscles to their normal resting length (or improve their resting length) (1 mark) as well as minimise the effects of DOMs. (1 mark)

2 marks

Total 12 marks

Question 8 a Any two of the following

- Muscular Power (1 mark) would be important to elevate the ball as high as possible when bouncing (1 mark)
- Flexibility (1 mark) would be important to ensure that the umpire can get as low as possible when bouncing the ball. (1 mark)
- Balance (1 mark) would be important to ensure that he does not fall over while in this position. (1 mark)

4 marks

Question 8 b

- Visualisation/Mental Imagery
- Positive self-talk

2 marks

Total 6 marks

Question 9 a

i. Phosphate Recovery Test 1 mark

ii. The work to rest Ratio is 1:5 (1 mark) which would be dominated by the ATP-PC energy system. (1 mark)

2 marks

iii. Any of the following responses.

This would be due to PC (or CP) not being fully replenished as it required 30 seconds for 70% replenishment (or 3 minutes for 98% replenishment) (1 mark). This places a greater reliance on the Anaerobic Glycolysis energy system which resynthesises ATP at a slower rate compared to the ATP-PC energy system. (1 mark) Students could also mention that as the ATP contribution from the Anaerobic Glycolysis system increases so too does an increase in metabolic by-products (or H⁺) which leads to fatigue and therefore less cones being made as the test progresses. (1 mark)

3 marks

iv. Any two of the following

- Tests should be conducted at the same time of day
- The same warm-up should be used prior to the test
- The same environmental conditions should be used
- Similar nutrition should be employed before testing
- Similar hydration should be evident before both tests
- Participants should be well rested
- The same equipment, clothing etc. should be used
- The performers activity levels should be the same before both tests

2 marks

Question 9 b Any of the following responses.

An efficient aerobic energy system will:

- Enable PC to be resynthesised at a faster rate (1 mark)
- clear metabolic by-products (or H⁺) at a faster rate (1 mark)
- An efficient aerobic system will be activated earlier in this test decreasing the reliance on the Anaerobic Glycolysis system, reducing the build-up of metabolic by-products. (1 mark)

2 marks

Total 10 marks

Question 10 a

Individual	Social Environment	Physical Environment	Policy
<i>One of the following:</i> Enjoyment Self- efficacy Education level	<i>One of the following:</i> Supportive behaviours Social climate Social norms	<i>One of the following:</i> Weather Geography Recreation infrastructure	<i>One of the following:</i> Active transport policy Urban planning policy Traffic

4 marks

Question 10 b

The participation levels in the Bike Share program maybe low during the winter months as weather conditions (Physical) such as rain, wind and cold may affect the people's enjoyment(Individual) of bike riding, like wise in the summer months the enjoyment (Individual) of bike riding maybe greater as the weather is warmer.

One mark for making a link between two areas of the social ecological model, 1 mark for discussing the inter-relationship in regards to the bike share program.

2 marks

Total 6 marks**Question 11 a**

Any plyometric exercise that focuses on the legs, such as; skipping, depth jumps, bench jumps, burpees, zig zag hops, jump & reach, etc. and answer must include a brief description.

1 mark

Question 11 b

Because of its high intensity & explosive nature, there is a greater risk of muscle microtears/DOMS, so rest is essential after heavy plyometric sessions.

1 mark

Question 11 c

Resistance training, short interval training or circuit training (circuit training response should emphasise a focus on the lower body)

1 mark

Question 11 d

Intermediate Interval Training, Fartlek training (with a higher amount of high intensity bursts)

1 mark

Question 11 e

- Detraining/Reversibility – “If you don’t use it, you lose it” whereby the body begins to revert to pre-training levels if exercise load reduces.
- Frequency/Maintenance – The athlete must train a minimum of twice per week to maintain fitness levels

2 marks

Total 6 marks**End of Question and Answer Book**